crosslinkable agent is diffused from the high polymer solution coating film (206 in FIG. 2d) to the second photoresist pattern (205 in FIG. 2d) due to annealing. The crosslinkable agent diffused into the second photoresist pattern (205 in FIG. 2d) is radically crosslinked with polymer of the second photoresist pattern (205 in FIG. 2d) to form an O-crosslinkable agent-O structure. Through this crosslink, the second photoresist pattern is hardened to be the hardened second photoresist pattern 205a, so that the etching tolerance property is rapidly increased.

Meanwhile, in case where the aqueous high polymer solution coating film (206 in FIG. 2d) containing the radical generator was formed in FIG. 2d, a radical is generated in the radical generator and the radical is diffused from the aqueous high polymer solution to the photoresist pattern (205 in FIG. 2d) by annealing. The radical is generated and diffusion during the annealing and the radical diffused into the second photoresist pattern (205 in FIG. 2d) is radically crosslinked with polymer of the second photoresist pattern (205 in FIG. 2d) to form a C-C bonding. Through this crosslink, the second photoresist pattern is hardened to be the hardened second photoresist pattern 205a, so that the etching tolerance property is rapidly increased.

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By reference to FIG. 2f, the interlayer insulating film 202 in the region exposed through the hardened second photoresist pattern (205a in FIG. 2e) is etched to form a via hole 207 through which a junction (not shown) at the bottom is exposed. Next, the second photoresist pattern is removed. Thereby, a dual damascene pattern 208 consisting of the trench 204 and the via hole 207 is completed.